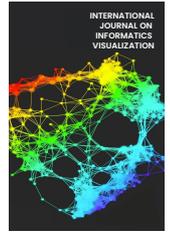




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The Design of E-Commerce System to Increase Sales Productivity of Home Industry in Indonesia

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Abstract— The household industry is the foundation of the existing home industry in Indonesia. It is categorized as a type of Small and Medium Enterprises (MSMEs) that significantly influence the Gross Domestic Product (GDP) ratio by up to approximately 10%. Since the pandemic of Covid-19, the home industry has increasingly stretched, especially in culinary and home craft products. The internet is one of the efforts to increase household industry sales. The household industry needs e-commerce to be a container for marketing its products. In this paper, we design an e-commerce system to support the sales productivity of the household industry in Indonesia. This study's e-commerce system or application is developed through some crucial stages. The stages are analysis through a questionnaire that represents needs in the field, selection of business models, namely B2B models with Virtual Storefront, marketplace concentrators, and lastly, Information Broker. Our infrastructure is determined for e-commerce development, and then strategy analysis is done using portfolio analysis, SWOT analysis, and competitor analysis. Based on the proposed strategy, we made a prototype as a designed e-commerce system that can increase sales for household businesses in cities in Indonesia. Important features in our proposed e-commerce system can accommodate many sellers or the household industry to establish relationships with many buyers based on geographical location, product search features based on closest positions or by city, and product categorization by familiar categories with household products.

Keywords— E-Commerce system; business model; household industry; prototype system.

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I. INTRODUCTION

The household industry (home industry) is the foundation of the cottage industry in Indonesia [1], [2]. This industry is run by housewives who help improve the family's economy [3]. According to the Indonesian Central Statistics Agency data, around 70 million Home Industries are classified as small and medium enterprises (MSMEs). The home industry in Indonesia has also experienced an increase from time to time. This industry has a lot of influence in increasing the Gross Domestic Product (GDP) ratio by approximately 10% [4], [5]. This fact makes many home industries one of the businesses that can support the income of families in Indonesia, especially those affected by the Covid-19 pandemic.

Since the Covid-19 pandemic, the home industry has grown, especially in culinary and home crafts fields. This growth happened because many workers were laid off due to social distancing and restrictions on community activities.

The use of the internet is one of the efforts to increase sales. Based on data from the Ministry of Economy and MSMEs, as of August 2021, there are around 15.3 million MSMEs that enter the digital ecosystem or about 23% of the total number of MSMEs, which is also under the Roadmap from the Ministry regarding Digital MSMEs 2021-2024 [6], [7].

E-commerce is one option to market products from the home industry. Figure 1 shows the needs of the Indonesian people with the existence of e-commerce. Based on 2019 data, it was found that the needs of the Indonesian people for online searches and purchases made above 75%, where this number will certainly increase significantly. The sales results that are mostly sold in e-commerce include food and personal care by more than 30% and various crafts by 23%. With these results, the development of e-commerce for the home industry can be carried out, where many home industries are involved in the culinary field [8]–[10].



Fig. 1 E-commerce Activities in Indonesia [11]

Home industries need e-commerce that can be a place to market their products. This E-commerce design is similar to a marketplace where many shops can sell various products from the home industry. The designs offered will be analyzed using several methods in defining data and business needs in the marketplace in Indonesia. The built store can be a personal store or a community that is incorporated into one business. The product categories that are the focus of this research are in the field of culinary and handicrafts. These applications allow sellers and buyers to select and search for the desired product. Applications can be used by the website or via a smartphone. This option makes it easy for users to use according to their respective conveniences [12]–[14]. The choice of city will also be a feature to make it easier for users to find the desired product and help customers from within and outside the city to interact with sellers more easily. It is hoped that with this e-commerce design, the home industry can continue to develop under the strategic plan of the Ministry of Economy and MSMEs for 2020-2024, can increase income for home industry players, and can also survive the Covid-19 pandemic era and can help users to be closer in finding the product they want in one application.

Economic developments in Indonesia have been affected since the Covid-19 outbreak. Since the outbreak, Indonesian economic growth has decreased by 2.5 percent and experienced inflation of 3 percent [15], [16]. This circumstance causes all sectors to be affected, including the home industry sector. The home industry is the backbone of the income of some Indonesians who have survived the pandemic.

Along with the pandemic that applies social distancing, the development of e-commerce is inversely proportional to economic growth. E-commerce is an option for shopping safely without leaving the house. E-commerce is also a liaison between sellers and buyers who can bridge the downturn of the home industry during the Covid-19 period [17]. The success of e-commerce also appreciates the number of people who shop for products from the home industry; customer satisfaction and the popularity of e-commerce are the determinants of e-commerce success [18], [19].

E-commerce has several business models that can be adapted to become e-commerce that continues to survive in the market. The business model used in e-commerce is usually the Business to Business (B2B) commerce model. The choice of B2B is because B2B is a model that can facilitate e-commerce with the web technology used to support it. There are many things that B2B can do, including funding and

increasing productivity, reducing costs, getting new suppliers and customers, and can also increase profits [20]–[22].

Strategies to survive in the world of e-commerce are also essential to be developed because there is already much e-commerce established nowadays. Meanwhile, the e-commerce that will be built is related to the home industry, which may be new to the e-commerce industry. Strategies to stay afloat can be done by analyzing several stages, such as SWOT analysis, analysis using Mc Farlan diagrams, and competitor analysis [23].

For perfecting the e-commerce design, a prototype is made to illustrate the final design. The use of a prototype uses an overview of the mobile application. The mobile application was chosen as a platform that can be used simply and efficiently [24]. The convenience offered by the mobile application can make Indonesian people more comfortable using it. Mobile application users' data evidence this; as much as 67.35 percent prefer to use the mobile application over the mobile web [25].

II. MATERIAL AND METHODS

A. Material

The material used in this study is data from several internet users who are e-commerce users. Data was collected by distributing questionnaires to target consumers. The questionnaire distribution was carried out by taking several samples from various regions in Indonesia. The questionnaire was administered online using a google form. The survey was conducted by giving ten questions to identify home industry e-commerce creation opportunities. The questions asked also include how knowledgeable the respondent or prospective consumers are about the home industry and whether the respondent has used many products from the home industry.

B. E-Commerce Design Development Flow

The development of e-commerce design is carried out in stages. In this study, the stages were developed into 5 phases, as shown in Fig 2. Fig 2 describes the stages that will be passed when the research is carried out. The explanation for each part will be explained as follows.



Fig. 2 E-Commerce Design Development Flow for Household Industry

1) *Data Analysis with Questionnaire*: Data analysis was carried out using a questionnaire as described in the required materials. The data has been distributed to respondents who are considered potential and often interact using e-commerce.

2) *Business Model Selection*: The business model selection is made by reading the literature related to the infrastructure to be built. The business model chosen will determine how it can interact with the e-commerce system to be built. The selection of business models is adjusted so that later e-commerce designs are in line and can increase the income of the home industry. Also, it is hoped that there is no miscommunication between the technologies used and that it

can reach long-term plans to continue to exist in the world of e-commerce [26]–[28].

3) *Determination of e-commerce infrastructure:* After selecting a business model, determining the infrastructure becomes essential in defining and building e-commerce. The infrastructure that makes home industry e-commerce will be divided into 5 layers, and layer 1 to layer 5 is adjusted to the layer on the business infrastructure [29], [30].

4) *Business strategy selection:* The business strategy was chosen based on several analyses carried out. The investigation is carried out in several stages: SWOT analysis, Mc Farlan quadrant analysis, and competitor analysis. This analysis was chosen to be the basis for determining the strategy used to survive in the world of e-commerce that can increase sales from the home industry [31]–[33].

5) *Develop a prototype for e-commerce:* The prototype is used to see the actual shape of the design to be built. The prototype will be made based on the mobile application's layout. The offered design of e-commerce will be adapted to the features that have been analyzed in the strategy section [34].

III. RESULTS AND DISCUSSION

A. Results of Questionnaire Implementation

The questionnaire was carried out by involving 35 people representing various regions in Indonesia. The number of questions distributed is ten questions. Some of the results of the answers to the questionnaire can be seen in Fig 3, 4, and 5 below.



Fig. 3 Answer Results of Question Number 1

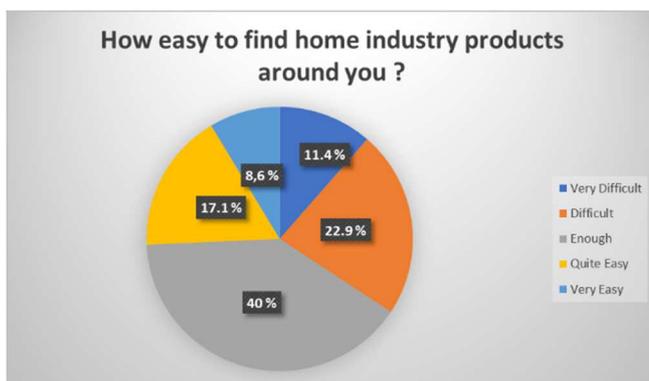


Fig. 4 Answer Results of Question Number 2

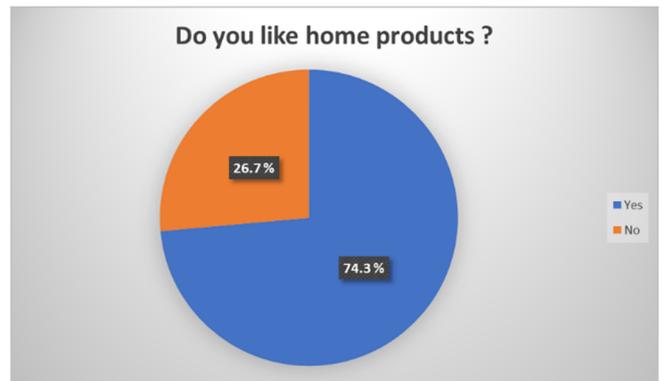


Fig. 5 Answer Results of Question Number 3

In Fig 3, respondents are asked whether they have ever used an online marketplace/e-commerce. A total of 88.6 percent of respondents answered yes, and the rest said never. In Fig 4, respondents are asked whether it is easy to find homemade products or those from home industries. Around 40 percent answered that finding products from the home industry was quite easy, while 22.9 percent responded that it was difficult. In Fig 5, respondents are asked questions about homemade products and whether they like to be used or not. Most, as much as 74.3 percent, answered that they liked homemade products. Based on the questionnaire results above, it was found that a marketplace or e-commerce can be built for the home industry. The opportunity to create e-commerce that supports the existence of the home industry is quite large and convincing enough to make a profit.

B. Business Model

The chosen business model is the B2B (Business to Business), which uses the customer portal concept or method. The customer portal was chosen because the e-commerce that will be built has many sellers or home industries that establish relationships with many buyers. B2B is also superior in terms of the price offered, which can be mutually agreed upon between the seller and the buyer [35].

The division of the designed business model is as follows [36]:

1) *Virtual Storefront:* E-commerce for the home industry is designed using traditional methods, namely using the internet to interact, and users can receive goods sold using courier services.

2) *Marketplace Concentrator:* The proposed E-commerce system for the home industry aims to inform home-based products from several home-based entrepreneurs at one point in each city. Customers or buyers can search, compare, and carry out the buying and selling process in one e-commerce. Based on household products, mostly food, grouping home products by the city is also very helpful for sellers and buyers because transactions until delivery need to be carried out simultaneously or directly.

3) *Information Broker:* This e-commerce will also provide information related to prices, products, availability, transactions made, and the position of sellers and buyers in the same city. This information can be seen quickly and provides actual and factual information.

C. Infrastructure Layer

The infrastructure layer is designed to make it easier to build e-commerce. The infrastructure selection will be divided into 5 layers consisting of Layer 1: the E-business service application layer, Layer 2: System software layer, Layer 3: Transport or network layer, Layer 4: Storage and Physical Layer; and Layer 5: Content and Data Layer. The data will be explained in Table 1.

TABLE I
INFRASTRUCTURE BUSINESS LAYER

Layer	Status
Layer 1: E-business service application layer	Use the Customer Relationship Management Information System because e-commerce will focus on transactions made by both parties, customers and shop owners.
Layer 2: System software layer	The system uses a mobile application, so you must register with the Playstore or Appstore. Servers to facilitate database storage are also needed to store data on sellers and buyers who join e-commerce. The use of software as a service (SaaS) is also recommended.
Layer 3: Transport or network layer	The required network is internet with adequate speed.
Layer 4 : Storage and Physical Layer	The server used will be managed by the hosting service provider. Computer hardware specifications used as servers require a processor of at least 3.5 Hetz, VGA at least 256 MB, RAM at least 1 GB, Hard disk at least 40 GB, NIC (Network Interface Card) / LAN.
Layer 5: Content and Data Layer	The data will be stored in the form of store data, namely detailed information about the store, store address, store owner, and ratings. Transaction information will contain transactions that were successfully carried out, transactions that failed to be carried out, or transactions that are still in process. User profiles contain personal data from service users. The personal data helps the interaction process between users and service or service providers, such as user addresses, to facilitate delivery of goods without the need to re-address, and the user's mobile number makes it easy to contact via telephone.

CRM is used for the first layer because CRM has proven to play an essential role in building good relationships with customers [37]. In the second layer, SaaS is needed to build e-commerce with a focus on CRM. This is because the focus on customers requires a platform that can serve anywhere, anytime, and is reliable [38]. The use of SaaS is also possible to minimize the costs paid by the developer. Both hardware, software, and databases can be carried out simultaneously [39].

D. The Strategy

Strategy analysis is used so that e-commerce can survive in the e-commerce market with competitors from other large e-commerce. Strategy analysis is divided into 3: portfolio analysis using Mc Farlan diagrams, SWOT analysis, and

competitor analysis. Table II shows the analysis we conduct. Table II shows that several advantages that can support our proposed e-commerce system can survive in the e-commerce market.

1) Portfolio Analysis

TABLE II
PORTFOLIO ANALYSIS

High Potential (Beware)	Strategic (attack)
<ul style="list-style-type: none"> The ordering system can be done online. Ease of finding suitable items in the same city. 	Monitor what products are available and which stores are ready to sell in real-time.
Support (Safe)	Key Operational (Explore)
Expedition of goods to help the delivery process of customer orders	Internet to access information anywhere and anytime

2) SWOT Analysis

TABLE III
SWOT ANALYSIS

Opportunity-Threat (Maxi-mini)	Opportunity-Strength (maxi-maxi)
<ul style="list-style-type: none"> Buyers who want to try new or unusual products on the market. Efficient and practical in shopping. 	Can be a pioneer of e-commerce and marketplace that oversees the home industry in Indonesia with the feature of grouping based on geographical location or city and product categorized based on food and non-food (handy crafts).
Weakness – Threat (Mini-mini)	Threat – Strength (Mini-maxi)
Compete with existing e-commerce (already has a reputation)	Compete with existing local e-commerce

Based on the SWOT analysis table provided in Table III, it can be concluded that e-commerce can survive by adding features and making it trusted by the wider community.

3) *Competitor Analysis*: For Competitor Analysis, e-commerce is competing with new entrants and New Business Models. There has not been much competition for similar e-commerce, especially those that categorize products or sellers in similar geographic locations or cities. So that cooperation can provide requests for goods from users or buyers from all over Indonesia.

Based on competitor analysis, it can be concluded that e-commerce can survive by adding features. The features are needed to make it easier for sellers and users to group their products or needs based on the closest geographic location or the same city, for example, for wet food sellers and buyers. E-commerce with these features can survive because it is a new company with new business models. Another strategy to stay afloat with the B2B business model can also prioritize user convenience. Customer satisfaction is one of the essential roles for customers to buy again on e-commerce applications that will later be built [40].

E. Prototyping

Prototyping is conducted to enable users to see a more detailed description of the design. Based on the analysis that

has been done previously, several prototypes can be designed as follows. Fig 6 shows the login page of our proposed e-commerce. Meanwhile, fig 7 shows the landing page in the form of favorite products and promo info based on the latest time. In Fig 8 and Fig 9, we can see products based on culinary categories or provided other types; besides that, category grouping can also be done based on geographic location, namely shops around or in the same geographic area, for example, one city.

BURAMRAM LOGIN

NAMA AKUN

KATA SANDI

Ingat akun saya!

[Lupa password?](#)

Login

Fig. 6 Login Page

PRODUK FAVORIT



Geprek Punia
Rp. 10.000



INFO PROMO



Yuk Kepoin Promo produk minggu ini
Promo berlaku dari 10 juni

Fig. 7 Landing Page

Produk Rumahan



Geprek Punia
Rp. 10.000

Fig. 8 Product Options of Culinary Homemade

Toko Rumahan Mataram



Toko Kue Mba Nina
Jalan pejanggik no.3, Mataram

Fig. 9 Nearby Shop Menu Options

BURAMRAM

BERANDA BELANJA TOKO HUBUNGI KAMI MASUK/REGISTRASI



Gambar	Produk	Harga	Jumlah	Total	Hapus
	Geprek Punia	Rp. 10.000	1	Rp. 10.000	X
	Kue Bolu MIX	Rp. 45.000	1	Rp. 45.000	X

EDIT KERANJANG

LANJUT BELANJA

ORDERAN TOTAL

Kode Kupon

Masukkan kode kupon jika anda memilikinya

Coupon Code

GUNAKAN KUPON

Subtotal Rp. 55.000

Total Rp. 55.000

PROSES DAN BAYAR

Fig. 10 Basket menu

Pemesanan Detail

Mataram *

Pilih Daerah Mataram Anda

Nama Depan * Nama Belakang *

Alamat *

Street address

Apartment, suite, unit etc. (optional)

Email * NoHp *
Phone Number

Catatan Untuk Orderan
Write your notes here...

Kode Kupon

Masukkan Kode Kupon yang anda miliki

Coupon Code

Belanja Detail

Produk	Total	Total
Ayam Geprek Puncu x 1	Rp. 10.000	Rp. 10.000
Kue Bolu MIX x 1	Rp. 45.000	Rp. 45.000
Belanja Subtotal	Rp. 55.000	Rp. 55.000
Total Belanja	Rp. 55.000	Rp. 55.000

Transfer Melalui Bank

Bayar Tunai Di Tempat

Bayar melalui Aplikasi Dana

Fig. 11 Order menu

IV. CONCLUSION

To measure the prototype that has been made, we use two methods, namely behavioral and attitudinal measurements [41]. Based on behavioral measurements, the results obtained are usually many users who order products in the form of food. Users are usually happy to see products in the handicraft category and prefer to order food products. As for attitudinal, before the user uses this application, the user uses an application based on an existing rival application.

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